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Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/W.No.10/RM/WMM/Gradation/2014-15

09.06.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. R. Madhusudhan**, Contractor, Bangalore.

Name of Work : Filling of pot holes in ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/VP/197/2014-15 Dated: 05.06.2014

Date of Testing : 09.06.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **25200**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	985	985	3.9	96.1	95-100
22.4	5415	6400	25.4	74.6	60-80
11.2	5210	11610	46.1	53.9	40-60
4.75	4255	15865	63.0	37.0	25-40
2.36	3810	19675	78.1	21.9	15-30
0.600	2580	22255	88.3	11.7	8-22
0.075	2560	24815	98.5	1.5	0-8

Note:

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ಯಲಹಂಕ ವಲಯ,
ಬೃ ಬೆಂ. ಮ. ಪಾ., ಬೆಂಗಳೂರು-97.

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Job No: CTCE/BBMP/W.No.10/RM/BC/Bitumen/2014-15 17.06.2014

BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE

As per IS2386 and IRC:SP:11-1984

CLIENT	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Mr. R. Madhusudhan,** Contractor, Bangalore.
NAME OF THE WORK	Filling of pot holes in ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	AEE/VP/197/2014-15 Dated: 05.06.2014
SAMPLE I/D	Filling of pot holes in Ward No.10.
DATE OF TESTING	17.06.2014

BITUMEN CONTENT DETERMINATION

Description	Sample 1	Sample 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	474	474
3. Weight of Asphalt and Mineral matter Extracted, g	26	26
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g	-	-
6. Weight of Bitumen Extracted, g. (corrected)	26	26
7. Bitumen content in %	5.20	5.20
8. Average	5.20	

GRADATION AFTER EXTRACTION

TABLE - 1

SIEVE SIZE	Percent Passing, %		JOBMIX
mm	Sample 1	Sample 2	Gradation
19	100.00	100.00	100
13.2	81.23	82.26	79-100
9.5	76.25	77.42	70-88
4.75	54.25	59.56	53-71
2.36	45.15	45.58	42-58
1.18	38.25	37.48	34-48
0.6	30.12	29.55	26-38
0.3	19.23	23.58	18-28
0.15	15.23	15.54	12-20
0.075	5.36	6.23	4-10

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Job No.: CTCE/BBMP/W.No.10/RM/WMM/Gradation/2014-15

09.06.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Mr. R. Madhusudhan**, Contractor, Bangalore.

Name of Work : Filling of pot holes in ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : AEE/VP/197/2014-15 Dated: 05.06.2014

Date of Testing : 09.06.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **25525**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	990	990	3.9	96.1	95-100
22.4	5650	6640	26.0	74.0	60-80
11.2	5315	11955	46.8	53.2	40-60
4.75	4350	16305	63.9	36.1	25-40
2.36	3825	20130	78.9	21.1	15-30
0.600	2595	22725	89.0	11.0	8-22
0.075	2415	25140	98.5	1.5	0-8

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09.06.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of the Work	Filling of pot holes in ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VP/197/2014-15 Dated: 05.06.2014
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	09.06.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	386	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	82	83	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	303	303	
4	Aggregate Impact value = percent fines	21.30	21.50	
	100* (W_2/W_1)%			**21.40**

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.10/RM/WMM/S-T/2014-15 09.06.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of Work	Filling of pot holes in ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VP/197/2014-15 Dated: 05.06.2014
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Wet Mix Macadam
Date of Testing	09.06.2014

Result : Flakiness Index = **12.35%**

Elongation Index = **13.95%**

Result : Combined Flakiness & Elongation index 26.30%

Note:

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Job No.: CTCE/BBMP/W.No.10/RM/BC/AIV/2014-15

17.06.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of the Work	Filling of pot holes in ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VP/197/2014-15 Dated: 05.06.2014
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Bituminous Concrete
Date of Testing	17.06.2014

Sl No.	Details	Trial No. 1	Trial No. 3	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	386	387	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	85	86	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.02	22.22	22.12

Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.10/RM/BC/Shape_T/2014-15 : 17.06.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	: **Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of Work	: Filling of pot holes in ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	: AEE/VP/197/2014-15 Dated: 05.06.2014
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Bituminous Concrete
Date of Testing	: 17.06.2014

Result : Flakiness Index = **12.85%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **26.10%**

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Job No.: CTCE/BBMP/W.No.10/RM/BC/Stripping/2014-15 17.06.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of the work	Filling of pot holes in ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VP/197/2014-15 Dated: 05.06.2014
Type of Mix	Bituminous Concrete
Date of Testing	17.06.2014

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.10/RM/BC/Sp_Wa/2014-15

17.06.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Mr. R. Madhusudhan,** Contractor, Bangalore.
Name of the Work	Filling of pot holes in ward No.10 (Doddabommasandra), Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	AEE/VP/197/2014-15 Dated: 05.06.2014
Type of Mix	Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	17.06.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2023	2025	2024	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1273	1275	1274	
4	Weight of saturated surface dry aggregate in air	W_3 g	2040	2042	2043	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	767	767	769	
6	Weight of oven dried aggregate	W_4 g	2025	2026	2028	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.640	2.641	2.637	2.640
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.693	2.698	2.690	2.693
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.74%	0.79%	0.74%	0.76%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Concrete is 2.0%

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